Microbial toxin

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Microbial toxins are toxins produced by micro-organisms, including bacteria and fungi. Microbial toxins promote infection and disease by directly damaging host tissues and by disabling the immune system. Some bacterial toxins, such as *Botulinum* neurotoxins, are the most potent natural toxins known. However, microbial toxins also have important uses in medical science and research. Potential applications of toxin research include combating microbial virulence, the development of novel anticancer drugs and other medicines, and the use of toxins as tools in neurobiology and cellular biology.[1]

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Bacterial toxin

Bacteria generate toxins[2] which can be classified as either exotoxins or endotoxins. Exotoxins are generated and actively secreted; endotoxins remain part of the bacteria. Usually, an endotoxin is part of the bacterial outer membrane, and it is not released until the bacterium is killed by the immune system. The body's response to an endotoxin can involve severe inflammation. In general, the inflammation process is usually considered beneficial to the infected host, but if the reaction is severe enough, it can lead to sepsis.

Some bacterial toxins can be used in the treatment of tumors.[3]

Toxinosis is pathogenesis caused by the bacterial toxin alone, not necessarily involving bacterial infection (e.g. when the bacteria have died, but have already produced toxin, which are ingested). It can be caused by *Staphylococcus aureus* toxins, for example.[4]

Botulinum neurotoxin

Botulinum neurotoxins (BoNTs) are the causative agents of the deadly food poisoning disease botulism, and could pose a major biological warfare threat due to their extreme toxicity and ease of production. They also serve as powerful tools to treat an ever expanding list of medical conditions.[5]

Tetanus toxin

Clostridium tetani produces tetanus toxin (TeNT protein), which leads to a fatal condition known as tetanus in many vertebrates (including humans) and invertebrates.

Staphylococcal toxins

Immune evasion proteins from *Staphylococcus aureus* have a significant conservation of protein structures and a range of activities that are all directed at the two key elements of host immunity, complement and neutrophils. These secreted virulence factors assist the bacterium in surviving immune response mechanisms.[6]

See also

- Alpha toxin
- Anthrax toxin
- Cyanotoxin
- Diphtheria toxin
- Exotoxin
- Pertussis toxin
- Shiga toxin
- Shiga-like toxin

References

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Categories: Microbiology | Toxins by type of organism

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